Factors to consider in planning a tailored undergraduate interprofessional education and collaborative practice curriculum: A scoping review

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Background: Health care students need to be practice-ready at qualification. Increased interest in and drive towards more collaborative practice necessitate consideration of teaching and learning factors unique to learning settings, to plan a tailored interprofessional education and collaborative practice curriculum, based on empirical findings.

Method: The Joanna Briggs Institute’s scoping review methodology guided this study. Eight online databases were searched, with 72 articles included for full review. Charted data, analysed quantitatively, included year, context, study design and population. The four-dimensional curriculum framework model, consisting of future health care needs, interprofessional competencies, methods of teaching and institutional support, directed the deductive analysis.

Results: Interprofessional education is best presented as a tailored curriculum, i.e. fitting the specific institution’s needs, based on formal rather than a voluntary participation and presented longitudinally. Buy-in from institutional management assists in overcoming barriers related to resourcing and staff participation.

Conclusion: Successful interprofessional education and collaborative practice curricula are dependent on an interplay of various factors such as specific professions involved, future healthcare needs of the country, expected capabilities and competencies of graduates, content and teaching methods, and available resources. Facilitators, as well as policymakers of academic and clinical institutions, could benefit from the synthesized evidence.

Keywords: interprofessional learning, pre-licensure, Joanna Briggs, four-dimensional curriculum model, graduate competencies
INTRODUCTION
The increasing complexity of patients’ needs has influenced health professional education and health policy and as a result, has strengthened a drive for preparing a “collaborative practice-ready” health workforce to respond to local health needs. Despite well-evidenced advantages of Interprofessional Education and Collaborative Practice (IPECP), the continued lack of implementation as part of undergraduate curricula, may be related to limited attention to factors that influence planning of a tailored IPECP curriculum. This scoping review initiated a research process for planning a university specific IPECP programme in South Africa.

Literature describing IPECP curriculum planning in Africa is limited. A variety of published documents, e.g., Interprofessional education and practice guides and competency frameworks from different countries, such as, Australia, USA and Canada, are available. However, despite the value of competency frameworks and practice guides for curriculum planning, these guides have a limited evidence base and mostly rely on field experts’ experience.

Most models guiding curriculum development either use a linear approach or do not explicitly address IPECP competencies e.g., Kern curriculum design model, Context, Input, Process and Product (CIPP model), Biggs model. In contrast, the four-dimensional curriculum framework (4DF) was specifically developed for IPECP. The scope of the 4DF allows curriculum planners to shape the IPECP curriculum, offering the most comprehensive learning activities. Although the 4DF has been applied in a range of studies, none indicated its use to develop a tailored IPECP curriculum.

When a university plans an IPECP programme, the unique context and how it differs from what available literature describes, should be considered. The 4DF guides tailored curriculum development to include (1) health care needs and available resources; (2) application of IPECP competencies; (3) teaching, learning and assessment variations; (4) institutional support and available resources.

The African context has unique challenges related to healthcare needs of the population and in equitability of available resources to ensure quality of life. In addition, within South Africa, implementation of IPECP programmes differ vastly due to lack of clear policy, differing IPECP competency applications and the level of commitment by university management. For example, health profession accreditation bodies or councils e.g., the Health Professions Council of South Africa, expect universities to include interprofessional education in their curricula. However, when professional accreditation bodies do not apply uniform guidelines on how IPECP should be incorporated into curricula of different professions, it causes additional challenges for planners of IPECP curricula, may be related to limited attention to factors that influence planning of a tailored undergraduate IPECP curriculum by identifying, analysing, and synthesising relevant articles.

METHODOLOGY
The five-step Joanna Briggs scoping review method was followed:

Stage 1: Identifying the research question
The research question was: What is known, from the published, peer-reviewed literature about the factors that influence the planning of a tailored IPECP curriculum for health care professionals?

Stage 2: Identifying relevant articles
A search strategy including seven databases (MEDLINE, CI-NAHL, Science Direct, PubMed, NexusIPE, Scopus) as well as Google Scholar search engine identified articles in English between 2009 and 2020. The Boolean search phrases were:

- “Interprofessional education” AND “Collaborative practice” AND/OR “interprofessional learning”
- “Planning” OR “Development”
- “Undergraduate students” OR “Undergraduates” OR “Pre-Qualification students” OR “pre licensure”
- “Curriculum” OR “Programme” OR “Module”

The articles reviewed included: participants who were undergraduate students enrolled in a health care professional programme, as well as course developers, and experts in IPECP. The included article context focused on curricula delivered at universities in classrooms clinical settings, and in urban or rural areas. Articles published globally were considered. Inclusion criteria for concepts covered “interprofessional education”, “interprofessional learning” and/or “collaborative practice”.

Initial exclusion criteria were studies that focused on single activities (e.g., oncology ward rounds), postgraduate students, qualified health care professionals, and non-health care professional students.

Stage 3: Study selection (please refer to PRISMA guide, Figure 1, page 80)
Selection was based on initial screening by title (n = 25704), then abstract (n=1324) and lastly full text (n=72). Two team members reviewed the articles and referred any disagreements to a third reviewer for the final decision for inclusion. The search strategy was refined after the initial research yielded a large number of articles. One of the main additional inclusion criteria added is that only empirical research articles in peer-reviewed journals were included. After initial screening it was decided that all articles based on secondary data with no evidence (e.g., guidelines) as well as literature summaries (as these could have been based on primary articles) were also excluded. Seventy-two articles were included and analysed. Figure 1 (page 80) summarises the study inclusion process after applying the refined inclusion criteria.

Stage 4: Charting the data
The author/s, publication year, title and journal information, country (study location), context (university or clinical setting), research method/study design, study population...
(e.g., students or experts, their level as juniors/seniors, their professions), were charted using Microsoft Excel. See addendum A.

Stage 5: Collating, summarising, and reporting the results
Quantifiable data were analysed descriptively, and a deductive qualitative thematic analysis based on the 4DF7 directed the thematic analysis. For included articles please refer to addendum A, page 88.

RESULTS
Quantitative data are presented in a narrative descriptive format. (The included articles are identified with an asterisk* in the reference list.)

Descriptive summary of demographic information
Participants: Of the 72 articles reviewed, 15 (20.8%) included key role players, e.g., IPECP experts, or course developers as participants. The remaining 57 (79.2%) of articles consisted of students as participants.

Course progression: Twenty-eight (49%) of the 57 articles that focused on students indicated that senior students participated, 16 (28%) focused specifically on first year students, and 13 (23 %) did not specify the year group of participants.

Professions: Nursing was the most represented profession with 42 (58.3%) studies followed by physiotherapy and medicine with 28 (38.8%) each, and occupational therapy and pharmacy with 26 (36%) each. A variety and different combinations of professions participated, from at least two up to 10 professions per session. The most frequent number of professionals included in a session were six as mentioned in 47 studies (65.3%), followed by five professions mentioned in 9 studies (12.5%) and three to four professions mentioned in eight studies each (22.2%).

Number of participants: A vastly different number of students were included in IPECP sessions, ranging from less than a 100 to 1 873 students. Not all studies mentioned the number of students. Of the 46 studies (64%) where the number of participants was stated, most studies, 24 (52.2%) reported on participation of less than 100 students, but seven (15.2%) involved more than 1 000 students. Fifteen studies (32.6%)
reported on small group teaching, with student numbers varying between three to 14 students per group.

**Country:** Only five studies (6.9%) from Africa met the inclusion criteria. The majority of the included studies, 48 (66.6%), were from countries with IPECP competency frameworks – 15 (20.8%) each from USA and Australia, and nine (12.5%) each from Canada and UK.

**Geographical considerations:** The geographical suitability for offering joint IPECP activities refers to the availability of a variety of professions at the same university. Universities who do not offer courses to a variety of health care professions relied on nearby universities to join their IPECP initiatives. Only three studies (4%) focussed on exposure of students to rural communities, one study described a mobile outreach exposure, and one study referred to exposure to a non-profit organisation. The rest of the articles referred to studies in the local area where the university was located.

**Focus of the programme:** Six articles (8.3%) focused on the importance of a theoretical model to guide planning. The majority of articles, 45 (62.5%) addressed interprofessional education in classroom settings. Eleven articles (15.3%) included only interprofessional collaboration and 10 (13.9%) focused on both education and collaboration.

**Descriptive summary of factors according to the four dimensions framework**

The data were analysed deductively using the 4DF. The 4DF guided the mapping of thematic data to each dimension. Findings are presented under each of the four dimensions. Figure 2 (above) provides a visual representation of the dimensions and associated factors.

**Dimension 1: Identifying future health care needs – preparing and capacity building to ensure meeting the needs of the population**

The planning of an IPECP curriculum should address the training needs of the health workforce, i.e., the need for and required competencies of the included professions and consider national policy related to health care worker training and health care delivery.

**Policy considerations:** National policies address the political, social, and cultural factors that influence health care worker training and health care delivery. Positive results were achieved with a nationally driven and coordinated approach, associated with research, i.e., coordinated nationally amongst universities and departments of health and embedded in government policies.

**Health workforce training:** An awareness of specific population health care needs, e.g., identifying care contexts and the variety of professionals needed, should inform training. IPECP can conserve resources when professionals are aware of their unique roles and duplication of services are prevented.

**Dimension 2: Defining and understanding interprofessional capabilities required for future success in practice**

When planning to address the capabilities of the health care workers in the IPECP curriculum, environmental needs and staff requirements need consideration.

**IPECP Curriculum:** IPECP should be part of a profession’s core curriculum and not seen as optional. The curriculum needs to be presented as a tailored programme based on the specific needs of the included professions. To tailor
the curriculum, planners need to identify shared prioritised themes for the specific professions involved, for example case studies where the role of each profession is overt\textsuperscript{22}. Learning and teaching activities should be staggered and graded from theoretical appreciation to placement learning, to examining the complexity of modern teamwork in a range of clinical settings\textsuperscript{6}. The advances in students' knowledge and experience should reflect the increasing complexity of IPECP activities\textsuperscript{44}.

**Time frames** for IPECP curriculum implementation were disputed\textsuperscript{36}. For example, Wilbur and Kelly\textsuperscript{26} stressed starting in first year, to allow for exposure before biases develop, in contrast to Imafuku et al.\textsuperscript{27}, who found it advantageous to start with final year students with an established sense of their own roles that they could apply during placements.

**Setting/environment:** Positive safe spaces, which could be shared, or neutral spaces, are experienced as supportive and conducive to learning and thus enable students to explore beliefs, learn to network professionally and to reflect on their own and others' personal and professional culture and values\textsuperscript{28,29}. Clinical settings need to allow students opportunities to observe the real world and learn about the respective professions and their interprofessional roles\textsuperscript{30,31}.

**Facilitator requirements:** Planning IPECP is a complex and dynamic process\textsuperscript{32} requiring an interprofessional team actively involved in planning and development\textsuperscript{33}. IPECP facilitators/trained lecturers, need to be both familiar with the institutions' environment, and skilled in facilitation and student supervision\textsuperscript{34}. Facilitators should rather self-identify and be able to role model teamwork and be passionate about IPECP\textsuperscript{34,35}.

**Dimension 3: Teaching, learning and assessment to address the development of core competencies**

**Teaching, learning and assessment:** Specific teaching and learning components need to be tailored to student variables (who), context (where), timing (when), content (what) and teaching methods (how). When grouping students, planners need to appreciate, acknowledge and maximise diversity\textsuperscript{36}. It is advisable to use intentional grouping of students (focused, heterogeneous in terms of gender, age, professions and cultures)\textsuperscript{37}, in groups with students of four to five professions\textsuperscript{38}. Learning activities need to ensure students appreciate each other's roles and contributions while being able to acknowledge both the usefulness as well as the limitations of their own knowledge\textsuperscript{39}. Jernigan et al.\textsuperscript{40} therefore suggested authentic case studies, with significant clinical detail, necessitating involvement of the interprofessional team for problem solving and encouraging clinical reasoning.

Findings highlighted theoretical frameworks conducive to IPECP including Social Capital Theory\textsuperscript{41}, Socio Cultural Learning\textsuperscript{42}, Problem Based Learning\textsuperscript{43} Complexity Theory\textsuperscript{24} and Constructivist Theory\textsuperscript{44}. Andragogical strategies to consider incorporated blended, face-to-face, flipped classroom, interactive and experiential learning/teaching\textsuperscript{45}. Rosenfield et al.\textsuperscript{46} caution about the use of large-scale activities as it could limit the amount of meaningful interaction. Assessments need to be aligned instructional methods with required outcomes\textsuperscript{46}.

**Students input:** Senior students, especially in their final year of study, can provide valuable input to curriculum development\textsuperscript{47}. Students could comment on internal factors (insight and motivation to participate) as well as factors outside the programme (logistics and timing), that impact students' participation, due to their lived experience of the profession specific and IPECP curriculum\textsuperscript{48}. Students identified authentic learning opportunities as experiencing problem solving in class, simulation, and clinical practice. Students appreciated opportunities to socialise both formally and informally with peers from other professions\textsuperscript{49}.

**Dimension 4: Supporting institutional delivery**

For long-term sustainability, IPECP needs to be part of the collective institutional vision\textsuperscript{50}, be embedded on symbolic and organisational culture levels\textsuperscript{51} and part of a valued curriculum\textsuperscript{52}. The characteristics of the institution and available resources requires special consideration.

**Characteristics of the Institution:** Multi-tiered support is required from committed staff members, both academics and clinicians, institution leadership/management and governmental stakeholders\textsuperscript{53}. Pragmatic considerations include faculty timetabling, structural complexities of university partnerships, institutional systems and processes\textsuperscript{54}.

**Physical, attitudinal, and human resources:** IPECP is resource and time intensive, due to significant coordination required\textsuperscript{55}. Centralised planning at a university, where planning is coordinated between different professions and involved schools could collectively address the logistics of implementation\textsuperscript{56}. Focused effort to provide resources or infrastructure, necessitates inclusion of strong administrative support\textsuperscript{44}. Attention should be on capacity to deliver the curriculum, e.g., sufficient human resources in terms of trained facilitators and sufficient administrative support. In addition, there should also be a concerted effort made to overcome perceived challenges such as time constraints in the timetable and lack of funds to present the programme\textsuperscript{51,57}.

**DISCUSSION**

This review revealed a growing body of literature that describes factors influencing IPECP planning. Articles increased steadily from 2009 to 2020, reflecting the possibility that more universities incorporated IPECP on a larger scale into their curriculum; or more research conducted into the planning of IPECP curriculum. Analysis of the 72 articles found most originated in countries where government policies as well as competency frameworks for IPECP are in place. The benefit of having such support is acknowledged. In South Africa, as in many other African countries, the policies of IPECP are emergent. Even though an abundance of international literature is available, few South African specific guidelines were found. Nevertheless, the authors gained an in-depth understanding of intertwined factors to consider when planning and IPECP curriculum and realized the gaps for the South African context.

The descriptive summary of factors according to the four dimensions reflected the dynamic interaction between the
four dimensions. Specific professions, future healthcare needs, expected capabilities, curriculum content, teaching methods and available resources impacted one another. It was evident that local, national, and international health and education policies influence IPECP application. For a tailored curriculum, planners need to be cognisant of the purpose and content of the policies, while aligning the curriculum with the specific institution’s mission and vision. In the South African context, the impact of possible changes related to the proposed National Health Insurance needs specific consideration when developing a national IPECP policy. ASSAF-55 proposed embedding IPECP in Health Professions Education in South Africa, as a multi-stakeholder, to make it more sustainable, by forming a national working group to develop and guide the implementation of a strategic plan for IPECP. The requirements of included professions’ professional regulators, e.g., Health Professions Council of South Africa (HPCSA) consisting of different professional boards for different professions, in addition to the Nursing Council and Pharmacy Council, need to be considered when the programme is planned. If the specific expectations in terms of IPECP of these regulators could be same, it would make it easier for programme planners to plan the curriculum for a range of stakeholders. Organisations such as the South African Association of Health Education Network (AfrIPEN), where IPECP experts work together to develop policies and resources for IPECP, contribute to growth in IPECP.

Worldwide there is an increasing demand for trained health care workers. From the scoped articles it became clear that IPECP in Africa is not as established as it is in developed economies, and one possible reason is the lack of national policies guiding IPECP. South Africa, with its particular geographical, socio-economic, cultural diversity, resource limitations and political history, has both universal as well as some unique challenges when it comes to the need for IPECP. The quadruple burden of disease in South Africa namely challenges in maternal, newborn and child health; HIV/AIDS and tuberculosis (TB); non-communicable diseases; and violence and injury combined with insufficient resources and the influence of poverty and workforce shortages makes the need for IPECP even more pronounced. In tailoring a curriculum, the health work force needs of the specific included professions, individually and collectively, must be considered. For example, include the common conditions treated by the profession, to ensure that the IPECP activities are authentic and reflect practice needs. IPECP could contribute to address health care’s triple aim for improving patient experience quality and satisfaction with care, and through this addressing the health of the population and reduce the per capita cost of health care. Through collaborative practice patient care could be rendered more effectively by preventing unnecessary delays in care, unnecessary duplication of services and avoiding the need for re-admission because patients were discharged prematurely. IPECP forms an important part of the plans of the National Health Insurance which emphasizes the need for patients to be treated by a team.

To present a tailored curriculum, the IPECP core competencies, that guide the outcomes of the IPECP curriculum and therefore the selection of learning opportunities (activities, teaching methods and assessment methods), need to determine the duration and timing of the curriculum. Selected learning opportunities should suit the student characteristics for example the needs of the year group and combination of professions involved. IPECP then facilitate the dual identity development of students as professional and as interprofessional team members. In the South African context, it is important to pay attention to the type of case study that is most relevant to the specific professions involved and to address challenges related to diversity during IPECP group work. Examples could be stroke, head injuries, substance induced psychosis, post-traumatic stress disorder, spinal cord injuries.

Facilitators need to understand the institution and the health care system where the programme is presented. Knowledgeable, enthusiastic facilitators who make student’s involvement enjoyable, contribute to students’ positive attitude to future interprofessional collaboration.

Student involvement in curriculum planning increase IPECP programme acceptance and involvement. Students who have experienced not only their own professions specific curriculum, but also the IPECP curriculum could share their experience of the learning opportunities’ relevance.

For the sustainability of any IPECP programme, buy-in from the specific institutions’ management is vital to overcome logistical barriers, such as financing and provide the necessary resources.

Throughout the review and the discussion, the relevance of sources was contemplated to ensure that it supports the South African context.

Limitations of the scoping review

Due to the abundance of available literature, important articles may have been inadvertently excluded, despite rigorous effort. Only five articles originating in Africa adhered to the inclusion criteria though there was abundance of international articles. This further highlighted the paucity of South African research in IPECP in terms of planning a curriculum relevant for the country’s needs. The IPECP articles from Africa focussed more on IPECP implementation and is evident of IPECP in Africa as an emerging research area. Even though the scoping review did not provide sufficient information related to planning a specific South African IPECP curriculum, the discussion did however, indicate how differences in the context could be identified and considered in planning and aligning information to the specific university context.

CONCLUSION

The results from this scoping review have the potential to guide the planning of a tailored IPECP curriculum for an African university. Several intertwined factors were presented for consideration by curriculum planners and IPECP organisers and presenters. Findings could support university
management and policymakers as it provides summarised and synthesised evidence on how to establish a tailored IPECP curriculum. Key considerations include the specific professions involved, future healthcare needs of the country, expected capabilities and competencies of graduates, content and teaching methods and available resources influence one another.

Consideration of unique institutional contexts could guide planning a new or revised IPECP curriculum. A tailored curriculum will ensure that the healthcare needs of the local population is met and that students master interprofessional competencies using context-relevant teaching strategies.

**AUTHOR CONTRIBUTIONS**

Hanlie Pitout designed the study, collected, and analysed the data and drafted the initial manuscript and revised the manuscript. Fasloen Adams and Sanet du Toit contributed to the study design, supervised the data collection and analysis, and was actively engaged in the writing of the manuscript and Daleen Castelein assisted with refining the manuscript for publication. All authors were included in aspects of study design, data collection, analysis, interpretation of data; and/or drafting the paper; as well as final approval of the submitted version to be published and agreement to be accountable for included information.

**DECLARATIONS OF COMPETING INTERESTS AND FUNDING**

The authors have no declarations of competing interests to make, and no funding was received for this research.

**REFERENCES**

Please note articles included in the scoping review are indicated with a *

https://apps.who.int/iris/handle/10665/70185. (WHO/HRH/HPN/10.3)
doi: https://doi.org/10.1080/0142159X.2017.1300246
doi: https://doi.org/10.3233/WOR-2012-1298
doi:https://doi.org/10.1016/j.apnr.2014.03.002.
doi: http://dx.doi.org/10.3109/13561820.2010.483366
Doi: https://doi.org/10.1057/978-1-137-53744-7_6.
doi:http://dx.doi.org/10.1111/jnu.12384.
doi:https://doi.org/10.1080/13561820.2019.162332
Doi: https://doi.org/10.22605 /RRH4336
doi:https://doi.org/10.1097/MD.00000000000019633.


39. *Jernigan SD, Hodgkins SR, Hildenbrand WC, Laverentz


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### Addendum A: Table I Summary of included publications

<table>
<thead>
<tr>
<th>Author names and year</th>
<th>Name of article</th>
<th>Main concept (IPE, IPECP or CP)</th>
<th>Name of journal</th>
<th>Research approach and method</th>
<th>Frequency Longitudinal (L): twice (T) once off (O)</th>
<th>Participants and year</th>
<th>Country and Context (university, clinical setting/ community area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Alinier et al., 2015</td>
<td>Simulation in Undergraduate Health Care</td>
<td>Simulation (IPE)</td>
<td>CJ: Simul Nurs</td>
<td>Qualitative MM = mixed methods</td>
<td>237 N, Pha, RD, PT, paramedic, SW</td>
<td>5 years</td>
<td>UK: British university</td>
</tr>
<tr>
<td>2 Anderson et al., 2016</td>
<td>Evaluating an interprofessional education curriculum: A theory-informed approach</td>
<td>Conceptual frameworks, theory (IPE)</td>
<td>Med. Teach.</td>
<td>SW: Meta-analysis</td>
<td>L: several years</td>
<td>Different stakeholders, 10 professions, students, teachers, practitioners, patients, carers</td>
<td>USA: University of North Carolina</td>
</tr>
<tr>
<td>3 Ateick Barr et al., 2018</td>
<td>The role of personal resilience and personality traits of healthcare students on their attitudes towards interprofessional collaboration</td>
<td>Personality and attitude (IPECP)</td>
<td>Nurse Educ. Today</td>
<td>L: cross sectional, descriptive study</td>
<td>184 fourth year students N, OT, PT</td>
<td>3 years</td>
<td>USA: University of Pittsburgh</td>
</tr>
<tr>
<td>4 Beck et al., 2018</td>
<td>Attitudes toward interprofessional education improve over time</td>
<td>Attitudes (IPECP)</td>
<td>J Interprof Educ &amp; Prac</td>
<td>Pre and post assessment</td>
<td>175 students Allied Health; M, N, Pha, Public Health</td>
<td>3 years</td>
<td>USA: Universities of Nebraska and Ohio</td>
</tr>
<tr>
<td>5 Berger et al., 2016</td>
<td>Encountering complexity in collaborative learning activities: an exploratory case study with undergraduate health professionals</td>
<td>Learning activities (IPE)</td>
<td>J Interprof Care</td>
<td>L: 47 students: Lab Tech, M, N, PT, OT, SLPA, RD, Midwifery</td>
<td>5 students/learning group</td>
<td>USA: University of Iowa, Hospital Heidelberg</td>
<td></td>
</tr>
<tr>
<td>6 Berger et al., 2017</td>
<td>Anchoring interprofessional education in undergraduate curricula: The Heidelberg story</td>
<td>Change management (IPE)</td>
<td>J Interprof Care</td>
<td>L: 254 students: 1st years: M, N, D, Pha</td>
<td>3 years</td>
<td>Germany: University of Heidelberg, Hospital Heidelberg</td>
<td></td>
</tr>
<tr>
<td>7 Botma, Y. 2019</td>
<td>Consensus on interprofessional facilitator capabilities.</td>
<td>Facilitator capabilities (IPECP)</td>
<td>J Interprof Care</td>
<td>Delphi study</td>
<td>5 students: 10 professionals, 15 supervisors, man. 4500 students participate</td>
<td>Canada, Quebec, Clinical</td>
<td></td>
</tr>
<tr>
<td>8 Braut et al., 2019</td>
<td>Implementation of IP learning activities in a professional praxis: technology</td>
<td>Technology (IPC)</td>
<td>J Interprof Care</td>
<td>Focus groups</td>
<td>31 students, 10 professions, 15 supervisors, man. 4500 students participate</td>
<td>Canada, Quebec, Clinical</td>
<td></td>
</tr>
<tr>
<td>9 Carbin-Koczonowska, 2019</td>
<td>As the twig is bent; so is the tree inclined: a survey of student attitudes toward interprofessional collaboration supported with the curricula analysis</td>
<td>Curriculum (IPECP)</td>
<td>J Interprof Care</td>
<td>Cross-sectional survey-based</td>
<td>502 final year students: M, Pha</td>
<td>3 years</td>
<td>Poland: Poznan University of Medical Sciences</td>
</tr>
<tr>
<td>10 C'connell et al., 2018</td>
<td>Student's input (IPE)</td>
<td>Student's input (IPE)</td>
<td>J Interprof Care</td>
<td>L: 15 years</td>
<td>19 key informants</td>
<td>Canada Universities</td>
<td></td>
</tr>
<tr>
<td>11 Casamia et al., 2019</td>
<td>Interprofessional communication in a socio-hierarchical culture: development of the TRI-O guide</td>
<td>Communication skills (IPE)</td>
<td>J Multidisc Healthc</td>
<td>Pre-post, quasi experimental</td>
<td>19 pilot</td>
<td>Canada: Newfoundland and Labrador University and Nursing School</td>
<td></td>
</tr>
<tr>
<td>12 Conway 2019</td>
<td>Implementing interprofessional learning in clinical education: findings from a utility-led evaluation</td>
<td>Clinical training (IPE)</td>
<td>Contemp Nurse</td>
<td>Interviews</td>
<td>16 students, academics, clinicians</td>
<td>Australia: University and hospital ward</td>
<td></td>
</tr>
<tr>
<td>13 Clanock et al., 2013</td>
<td>A top-down approach impedes the use of theory?</td>
<td>Theory (IPE)</td>
<td>J Interprof Care</td>
<td>M: Interleveic</td>
<td>5 years</td>
<td>L: 5 years</td>
<td>UK: 8 Universities</td>
</tr>
<tr>
<td>14 Croser et al., 2016</td>
<td>Educators working together for IPE: From “fragmented beginnings” to “being intentionally IPE”</td>
<td>Educators attitude (IPE)</td>
<td>J Interprof Care</td>
<td>L: 5 years</td>
<td>M, N, radio, SW, OT, PT, SP, HH: IPE educators</td>
<td>Australia: Newcastle University</td>
<td></td>
</tr>
<tr>
<td>15 Curran et al., 2015</td>
<td>Longitudinal study of effect of IPE curriculum on student satisfaction and attitudes toward IP team</td>
<td>Logistics (IPECP)</td>
<td>J Interprof Care</td>
<td>L: 3 years</td>
<td>M, SW, N, Pha</td>
<td>3 years</td>
<td>USA: University of Nebraska and hospital ward</td>
</tr>
<tr>
<td>16 Cusack O'Donoghue, 2012</td>
<td>The introduction of an interprofessional education module: students' perceptions</td>
<td>Theory (IPE)</td>
<td>Prim. Care</td>
<td>L: 3 questionnaires, time series</td>
<td>145 students M, N, Pha</td>
<td>3 years</td>
<td>Canada: University of British Columbia, University of British Columbia</td>
</tr>
<tr>
<td>17 De Vries-Erich et al., 2017</td>
<td>Identifying facilitators and barriers for implementation of IPE in medical education in the Netherlands</td>
<td>Identifying facilitators and barriers (IPE)</td>
<td>J Interprof Care</td>
<td>L: 48 students</td>
<td>14 health educators, professions not specified</td>
<td>Netherlands: Amsterdam, different universities IPE SIG</td>
<td></td>
</tr>
<tr>
<td>18 Engle et al., 2017</td>
<td>A Power Experience: A Phenomenological Study of Interprofessional Education</td>
<td>Social Interaction (IPE)</td>
<td>J Prof Nurs</td>
<td>L: 17 students M (list = 2nd; N: 3rd and 4th year</td>
<td>3 years</td>
<td>Canada: Ontario, two Universities</td>
<td></td>
</tr>
<tr>
<td>19 Fitzharrmons et al., 2014</td>
<td>A learner developed longitudinal interprofessional education curriculum</td>
<td>Student input (IPE)</td>
<td>J Interprof Care</td>
<td>Pre-post-test experimental</td>
<td>480 full time and part time students</td>
<td>Canada: University of British Columbia, University of British Columbia</td>
<td></td>
</tr>
<tr>
<td>20 Fook et al., 2013</td>
<td>Taking the long view: exploring dev of IPE</td>
<td>Logistics especially leadership (IPE)</td>
<td>J Interprof Care</td>
<td>L: 10 years</td>
<td>19 key informants: socio-demographics, clinical sciences, M, N, OT, PT, podiatry, RD, SW</td>
<td>USA: University of California, San Francisco, on behalf of the University of California, San Francisco.</td>
<td></td>
</tr>
<tr>
<td>21 Torle F, Fowler, 2009</td>
<td>Participation in interprofessional education: An evaluation of student and staff experiences</td>
<td>Group dynamics, theory (IPE)</td>
<td>J Interprof Care</td>
<td>L: 5 years</td>
<td>Undergraduate students and staff: OT, PT, RD</td>
<td>Canada: University of British Columbia, University of British Columbia</td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Author names and year</td>
<td>Name of article</td>
<td>Main concept (IPE, IPECP or CP)</td>
<td>Method</td>
<td>Frequency Longitudinal</td>
<td>Country and Context (University/clinical setting/community area)</td>
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<tr>
<td>22</td>
<td>Fougeri &amp; Hornbæk, 2011</td>
<td>Students reflections on shadowing Interprofessional team work: a Norwegian case study</td>
<td>Clinical learning (IPC)</td>
<td>J Interprof Care</td>
<td>CQI: focus groups: 1× (2nd year students: OT, PT, N, 30 reps [3 in group])</td>
<td>Norway: Oslo; hospital and homes</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Gilligan et al., 2014</td>
<td>Recommendations from recent graduates on improving IPE in university programs</td>
<td>Student input (SPECIP)</td>
<td>BMC Med. Educ</td>
<td>CQI: focus groups: 1× (68 recent graduates, 12 focus groups)</td>
<td>Australia: Perth hospital</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Hamilton et al., 2016</td>
<td>Do commencing students differ in IP learning and practice attitudes</td>
<td>Team and group (IPE)</td>
<td>BMC Med. Educ</td>
<td>CQI: GSS, ATCHS, IEPS, International big 5 mini-markers test 210; parametric: 1st year students</td>
<td>Australia: Melbourne, University</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Hayashi et al, 2012</td>
<td>Changes in attitudes toward interprofessional health care teams</td>
<td>Influence of year level (IPE)</td>
<td>J Interprof Care</td>
<td>CQI: On-line survey, ATCHS, RIPLS</td>
<td>Students: 1st and 3rd years of N (88), OT(32), PT(28), Lab (48) Japan: Gunma University</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Hean et al., 2012</td>
<td>Theoretical insights into IPE</td>
<td>Theory (IPE)</td>
<td>Med. Teach.</td>
<td>CQI: case study</td>
<td>ANEE Guide</td>
<td>UK: University Bournemouth, Southampton, Birmingham, Birmingham</td>
</tr>
<tr>
<td>28</td>
<td>Hornsey et al., 2018</td>
<td>Effect of IPE on Medicine and Nursing</td>
<td>Curriculum implications (IPE/CP)</td>
<td>BMC Nursing</td>
<td>CQI: Delphi</td>
<td>25 experts</td>
<td>Germany: University, OnzeSfeer</td>
</tr>
<tr>
<td>30</td>
<td>Jernigan et al., 2018</td>
<td>Teaching for Practice: The Impact of a Large-Scale Interprofessional Foundational Program</td>
<td>TeamSTEPPS (IPE)</td>
<td>J Allied Health</td>
<td>MInt: Questionnaires</td>
<td>755 students of 15 professions: OT, PT, SLPA, HN/D, M, N, Pha; 1-3 rd years</td>
<td>USA: University of Kansas</td>
</tr>
<tr>
<td>31</td>
<td>Jernigan et al., 2018</td>
<td>Using complexity theory to develop</td>
<td>Learning and thinking (IPE)</td>
<td>BMC Med. Educ</td>
<td>MInt: Questionnaire and analysis of video and case study 1×</td>
<td>1220 students, different year groups: Rad, M, N, OT, PT, Pha, Pha, N; 5 – 8 students per group</td>
<td>Australia: University, Sydney</td>
</tr>
<tr>
<td>33</td>
<td>Karuguti et al., 2019</td>
<td>Analysing the cognitive rigor</td>
<td>Assessment (IPE)</td>
<td>J Interprof Care</td>
<td>CQI: Quantitative content analysis: DOK framework</td>
<td>Curriculum for PT, OT, Psych, N, Natural Medicine, Sport Sciences</td>
<td>South Africa: University: Western Cape</td>
</tr>
<tr>
<td>34</td>
<td>Keeso et al., 2019</td>
<td>Discharge Day: A Case-Based Interprofessional Exercise About Team Collaboration in Pediatrics</td>
<td>Discharge planning (IPE)</td>
<td>MedEdPortal</td>
<td>MInt survey</td>
<td>Final year: 192, M, Pha, HN/1D; [per group]</td>
<td>USA: Harvard Medical School</td>
</tr>
<tr>
<td>35</td>
<td>Kickett et al, 2014</td>
<td>A Model for Large-Scale, Interprofessional: Compulsory Cross-Cultural Education with an Indigenous Focus</td>
<td>Teaching (IPE)</td>
<td>J Allied Health,</td>
<td>CQI: Survey with qualitative and quantitative data 1×</td>
<td>1571 students, 1st years, 50 groups, 19 professions, N; Public Health, PT, Pha, S, N, Psych, oral health others</td>
<td>Australia: Perth University, Curtin</td>
</tr>
<tr>
<td>37</td>
<td>Larmore et al., 2017</td>
<td>Impact of team composition</td>
<td>Team composition (IPE)</td>
<td>J Interprof Care</td>
<td>CQI survey 2 group quasi-experimental: RIPLS and IEPS</td>
<td>991 Students S – 10 professions: D, N, OT, PT, SLPA, Pha, PS, Exercise Science</td>
<td>USA: Universities in Arkansas</td>
</tr>
<tr>
<td>38</td>
<td>Lehner et al., 2015</td>
<td>Peer-led problem-based learning in Interprofessional Education</td>
<td>Students input (IPE)</td>
<td>Med. Educ online</td>
<td>CQI: Model interprofessional design study: IEPS</td>
<td>MM</td>
<td>USA: University and hospital, Alaska</td>
</tr>
<tr>
<td>39</td>
<td>Levet-Jones, et al 2018</td>
<td>Case Studies of Interprofessional Education Initiatives From Five Countries</td>
<td>Case studies of application (IPE)</td>
<td>J Nurs Scholarsh</td>
<td>MM</td>
<td>Compartment of settings with different types and numbers of students in each</td>
<td>Australia: University of Technology Sydney and 6 others</td>
</tr>
<tr>
<td>40</td>
<td>Lockeman et al., 2017</td>
<td>Outcomes of Introducing Early Learners to IPE competencies in Classroom Setting</td>
<td>Socialisation (IPE)</td>
<td>Teach Learn Med.</td>
<td>MInt: case series, students self-assessment with SPICE-R2 pre and post, Student peer assessment, Faculty Assessment 1×</td>
<td>1st years: 555: D, dent hygiene, M, N, OT, PT, Pha [5-6 students in group]</td>
<td>USA: University, Virginia</td>
</tr>
<tr>
<td>42</td>
<td>McKenna et al, 2014</td>
<td>Promoting Interprofessional understandings through online learning: A qualitative examination</td>
<td>Online learning (IPE)</td>
<td>NHS</td>
<td>CQI: 3 focus groups: within N: 15-25 students each</td>
<td>Students: different year groups: OT, PT, N, HN, emergency care</td>
<td>Australia: University, Melbourne</td>
</tr>
</tbody>
</table>
44. Melor et al., 2023

Just working in a team was a great experience. - 5 perspectives on the learning experience of an IPE program

Students experiences (IPE)

J Interprof Care

QL: Interview: Interpretative phenomenological analysis

T X

M, Pha, N, OT, PT | [6 - 8 students in group]

South Africa: University of Pretoria

45. Michalec et al., 2017

Health Professions Students' Perceptions of Their IPE program

Students perceptions (IPECP)

J Allied Health

Case study: Interviews

2 X

20 students from 6 professions (Couple and family therapy, M, N, OT, PT, Pha) 1st and 2nd years

USA: University Delaware

46. Mot et al., 2015

Building an Interfaculty IPE curriculum: University of Laval

Logistics (IPE)

Edu Health

Case study

L: 10 years

10 Health and Social Sciences programs, 400 students [8 - 10 students in group]

Canada, University: Quebec

47. Muller et al., 2019

The value of interprofessional education in identifying undressed primary health-care challenges in a community: a case study from South Africa

Primary health care (IPECP)

J Interprof Care

QN: case study

L: 4 years

Students: M, OT, PT, SLPA, HN/D, SW, N, RD, Podiatry

South Africa: Stellenbosch University: community, rural area

48. O'hara et al., 2018

Development of an learning programme to improve knowledge of interprofessional education. British Journal of Nursing

E-learning in IPECP

Nursing, 27 (23), 1240-1245.

QN: case study

T X

19 students: M, OT, PT, SLPA, HN/D, SW, N, RD, Podiatry

Ireland: Queen's University Belfast

49. Olson & Brownan, 2016

Reimagining health professional socialisation

Professional ID (IPE)

Health Sociology review

QL: Interviews

L: first year

9 professionals, 400 - 900 students 1st and 2nd year: OT, PT, podiatry, Therapeutic recreation, health service management

Australia, University: New South Wales

50. Olson et al., 2017

Reimagining health professional socialisation

Professional ID (IPE)

Health Sociology review

QL: Interviews

L: first year

19 Students: 1st, 2nd year, 6 professions: OT, PT, podiatry, Therapeutic recreation, (Traditional Chinese medicine)

Australia, University: Queensland

51. O'neil-Pirozzi et al., 2017

Early exposure (IPE)

J Interprof Care

QN: post intervention

L: 127 students: 1st years, N, Pha, PT, SLPA

USA: Northern Eastern University

52. Pardeus, 2013

Not left to chance: curriculum framework

Curriculum content dual IPE (IPECP)

J Interprof Care

Qualitative enquiries

T X

N, OT, Applied exercise science, athletic training, dental hygiene

USA: Portland University

53. Paslawski et al., 2014

Action, reflection and evolution: a pilot implementation of IPE across 3 disciplines

Less successful (IPECP)

J Res Interprof Pract Educ

Action research

T X

OT, ST, PT curriculum developers

Canada, University: Alberta

54. Pratt et al., 2016

Practical Strategies for Integrating IPE

Faculty (IPECP)

Groups, Ther. health Care

QL: focus groups

L: OT, N, SW, Med Lab [8 -12 students in group]

USA: University, Saginaw Valley

55. Reitma et al., 2019

Health students' experiences of the process of interprofessional education: a pilot project

IPE process

J Interprof Care

MN: sequential

T X

N, Pha, HN/D, Ps, Sw, Hn

South Africa: North West University

56. Rosenfeld et al., 2011

Perceptions versus reality

Student expectations (IPE)

Med. Educ

QL: exploratory case study: focus groups

T X

M, Pha, D, OT, SW

Canada, University: Ontario

57. Rozzi et al., 2015

Exploring first-year pharmacy and medical students' experiences during longitudinal IPE

IPE intro early or late (IPECP)

Curr Pharm Teach Learn

QL: focus groups & students per group

T X

18 Pha and M, I1st year students [3 students in a team]

USA, University: Philadelphia

58. Stanley & Stanlery, 2015

The HEIPS framework: Scaffolding interprofessional education starts with health professional educators

Educators framework (IPECP)

Nurse Education Practice

QL: Interpretative phenomenological individual interviews

T X

26 educators

Perth, Western Australia, 5 Universities

59. Streete et al., 2014

Interprofessional health education in Australia: 3 project for curriculum

Curriculum (IPE)

Appl Nurs Res

MN: surveys and interviews

T X

9 Univ, NGOs and Industry bodies

Australia: Universities:

60. Stroka et al., 2020

Attitude adjustments after global health inter-professional student team experiences

Mobile outreach (IPC)

Med J Med J

MN: questionnaire and survey

T X

45 Students, first to 4th year: M, Physician assistants, N

USA: Penn State University Community involvement

61. Soudra et al., 2018

Effect of interprofessional Education on Role Clarification and Patient Care Planning by Health Professions Students

New course (IPECP)

Health Prof Edu

QN: Descriptive survey

T X

265 senior students D, Med Lab, HN/D, PT, Pha

Lebanon: Beirut Arab University

62. Stanley & Stanlery, 2019

The HEIPS framework: Scaffolding interprofessional education starts with health professional educators

Framework for facilities (IPECP)

Nurse Edu in Pract

QL: Interpretive phenomenological framework

T X

26 Educators

Australia: Charles Sturt University

63. Tartanouil et al., 2014

Using the IDEA framework in an IP didactic elective course; roles and responsibilities

Dual ID (IPE)

J Interprof Care

QN: RIPS, IPEC

T X

Allied H, D, M, N, Pha and Public health [10 students in group]

USA, University, New Orleans

64. Titus & Roman (2019)

Predictors if student agency: the relationship between student agency, learning support and learning experience in an interprofessional health science faculty

Students support (IPE)

J Interprof Care

QN: questionnaire

T X

PT, OT, N, Sw, Ps, D/HN, Nat Med

South Africa: University of Western Cape

65. Van Lierop et al., 2019

Jointly discussing care plans for real-life patients: The potential of a student-led interprofessional team meeting in undergraduate health professions education

Real life cases (IPECP)

Perspect Med Educ

QL: focus groups

T X

360 X 2 M, N, Allied Health [50 students of which 5 M]

The Netherlands: Maastricht University, Hospital

66. Vannière & Andrews, 2020

Building great health care teams: enhancing interprofessional work readiness skills, knowledge and values for undergraduate health care students

Patient voice (IPECP)

J Interprof Care

QN: Pre post study

T X

28 Final year students: SW, OT, PT, SLPA, N, Psy, HN/D [8 students per group]

Australia: Victoria University

67. Walker et al., 2020

Students' experiences and perceptions of interprofessional education during rural placement: A mixed methods study

Rural placement learning opportunities (IPECP)

Nurse Educ Today

MN: RIPS and interviews

T X

60 Students of Allied Health, M, N, Midwifery

Australia: Monash University Rural area
<table>
<thead>
<tr>
<th>Author names and year</th>
<th>Name of article</th>
<th>Main concept (IPE, IPECP or CP)</th>
<th>Name of journal</th>
<th>Research approach and method</th>
<th>Frequency</th>
<th>Participants and (year level)</th>
<th>Country and Context (university /clinical setting/ community area)</th>
</tr>
</thead>
<tbody>
<tr>
<td>68. Walker et al., 2019</td>
<td>Interprofessional simulation in a student community clinic: Insights from an educational framework and contact theory</td>
<td>Framework development (IPE)</td>
<td>BMC Adv Simul (Lond)</td>
<td>QL: Interviews</td>
<td>TX</td>
<td>40 students, 12 SPs and 5 facilitators</td>
<td>Australia: Monash University, Clayton</td>
</tr>
<tr>
<td>70. Waterston, 2011</td>
<td>Interaction in online interprofessional education case discussions</td>
<td>Online (IPECP)</td>
<td>J Interprof Care</td>
<td>MM: survey, online discussions, care management plans</td>
<td>TX</td>
<td>490 students, 77 facilitators, D, M, OT, Pha, PT [6-8 per group]</td>
<td>Canada, University, Toronto</td>
</tr>
<tr>
<td>72. Wilbur + Kelly, 2015</td>
<td>Interprofessional impressions among nursing and pharmacy students</td>
<td>Students attitudes, beliefs, values (IPE)</td>
<td>BMC Med. Educ</td>
<td>QL: focus groups and interview</td>
<td>TX</td>
<td>200 students, N and Pha, year not indicated</td>
<td>Middle East: Qatar University</td>
</tr>
</tbody>
</table>